

Application No.: 10/698,361

Docket No.: 20513-00598-US

REMARKS

In view of the above amendment, applicant believes the pending application is in condition for allowance.

The Office Action and prior art relied upon have been carefully considered. In an effort to expedite the prosecution, claim 1 has been amended to avoid further rejection of claims 1-10 under 35 U.S.C. 112, second paragraph.

Claims 1 and 5-9 are rejected under 35 USC 102(b) as being anticipated by USHER (GB 1 339 542).

In this document, the corrugations of the plates in the heat exchanger bundle are disposed so as to be adjacent to one another and cover the entire surface area of the central zone of the heat exchanger plate. The corrugations may be directed in a longitudinal direction of the plate which constitutes a general flow direction for the fluids between which heat is exchanged.

The corrugations of each plate directed along a longitudinal axis of the plate between an inlet end portion and an outlet end portion of the plate, themselves comprise substantially rectilinear segments following one another in the longitudinal direction and extending obliquely relative to said plate direction. The successive and oblique segments are inclined relative to the longitudinal axis of the plate along which they are disposed successively to one side and to the other side of the longitudinal axis so as to constitute a zigzag line. The adjacent corrugations constitute ridge lines in a first face and also in an opposite second face of the heat exchanger plate.

According to the invention, secondary corrugations 5 are made in each of the plates 1 of the heat exchanger to extend in a transverse direction 6, i.e. aligned in a general manner with transverse axes 6 making an angle that can lie in the range 45° to 90° with the longitudinal direction 2 of the axes 4 of the first corrugations. As shown in Figure 1, the second corrugations 5 may be directed along axes 6 that are perpendicular to the longitudinal axes 4 of the plate 1. The second corrugations 5 comprise successive rectilinear segments each making an angle lying

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in the range 0° to 30° with the transverse alignment direction 6, two successive segments of a corrugation 5 being oriented in a first sense and in an opposite second sense relative to the transverse alignment direction 6. As a result, successive segments of the transverse second corrugations make angles lying in the range 120° to 180° between one another.

The transverse corrugations 5 may be disposed in a plurality of transverse deformation zones 8 each aligned along the direction of a transverse axis 6.

Heat exchanger plates of the invention thus enable deformation to be absorbed in the longitudinal direction, and in particular deformation due to thermal expansion of the sheets, without stresses appearing in the main portions of the sheets between the deformation zones.

The absorption of deformation due to thermal or mechanical stresses in the sheets of a heat exchanger in operation by means of the deformation zone also serves to limit stresses in the heat exchanger bundle constituted by a stack of sheets of the invention.

This effect whereby sheet deformation is absorbed in the longitudinal direction can be obtained in a manner that is entirely satisfactory when using deformation zones that are constituted by transverse corrugations of total area representing 5% to 10% of the total area of the longitudinal corrugations of the sheets.

For the reasons set forth above, applicant believes that the claims are not anticipated by Usher and should be allowed.

Applicant notes the indicated allowability of claims 2-4 and 10. These claims are now in condition for formal allowance.

In view of the above, consideration and allowance are, therefore, respectfully solicited.

In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

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The Director is hereby authorized to charge any fees, or credit any overpayment, associated with this communication, including any extension fees, to CBLH Deposit Account No. 22-0185, under Order No. 20513-00598-US from which the undersigned is authorized to draw.

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Respectfully submitted,


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